

REMARKS

This application pertains to a novel separation module.

Claims 2, 4-11, 13-16 and 18-28 are pending, although claims 18-25 and 28 have been withdrawn from consideration as drawn to non-elected subject matter.

Applicants respectfully request that upon the allowance of claims drawn to the elected subject-matter, the non-elected claims be rejoined.

The pending claims are being amended to more clearly recite that the "ceramic capillaries" are "**porous** ceramic capillaries". Support can be found in the original specification at page 11, line 31; page 12, line 13; page 13, line 6 and page 14, line 3. No new matter is added.

In the Office Action, the Examiner indicates, under the heading "Response to Amendment" that each of the previous rejections have been "modified in light of applicants' amendments." However, none of the previous rejections have been repeated, and Applicants' therefore believe that instead of simply being "modified", they have been withdrawn and that the only rejections pending are those set forth under the heading "Claim Rejections - 35 USC § 103" beginning on page 3 of the Office Action. Clarification is respectfully requested.

Rejections under 35 USC § 103 (a)

Claims 4-5, 7-9 and 26-27 are now rejected under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774)

The Examiner departs from the Filippi reference correctly stating that said reference fails to disclose several limitations of Applicants invention according to Claim 27.

The limitations missing in the disclosure of the Filippi reference are:

- a) the ceramic capillaries used being sintered
- b) said sintered ceramic capillaries having an internal diameter ranging from 0.1 to 8 mm
- c) said sintered ceramic capillaries being joined together by staggered ceramic film strips being at least partially pressed around said sintered ceramic capillaries
- d) said staggered ceramic film strips being wound into at least one bundle
- e) said sintered ceramic capillaries being spaced apart from adjacent sintered ceramic capillaries in said bundle by a defined distance established said staggered ceramic film strips
- f) said staggered ceramic film strips functioning as baffle plates
- g) said sintered ceramic capillaries passing through an end plate at a defined distance from an end of an adjacent sintered ceramic capillary also passing through an end plate.

Comparing Claim 27 with the disclosure of the Filippi reference one can see that the Filippi reference discloses only a separation module comprising at least one wound bundle of a plurality of potentially ceramic capillaries as to Claim 27. The Examiner contends that the Filippi reference also discloses “defined” distances between said capillaries.

However, Applicants respectfully point out that the distance between the capillaries of the Filippi reference is by no means “defined” as it is in Applicants' invention as defined by Claim 27. According to the disclosure of the Filippi reference the capillaries are held together in a woven mat build up from said capillaries and from filaments such as metal strand or nylon (see Col. 5, Lines 30-36 and Fig. 6).

However, there is a technical drawback in said mode of interconnecting said capillaries in a mat. The capillaries in the Filippi reference are able to move in the filaments if the tension of said filaments on the capillaries loosens for instance if a pressure pulse is applied to the apparatus. Therefore, the distance between the

capillaries of the Filippi reference is by no means “defined” but rather can vary over a certain range.

The Filippi reference further fails to disclose the limitation that

- h) the sintered ceramic capillaries in the bundle are spaced apart from an adjacent sintered ceramic capillary by a defined distance.

Furthermore it should be noted that the Filippi reference teaches that use of “flexible capillary tubes” are preferred (see Col. 2, lines 25-27).

To overcome said lack of disclosure of the limitations a) to g) of the current invention as defined in Claim 27, the Examiner refers to the Borelli reference as evidence that one of ordinary skill in the art would have found using sintered ceramic capillaries obvious to replace those as used in the Filippi reference.

First of all, Applicants respectfully submit, that the Examiner has not provided any reason why a person of ordinary skill in the art would be taught, suggested and/or motivated to combine the teaching of the Borelli reference with that of the Filippi reference when departing from the Filippi reference.

Applicants rather doubt that this can be established at all, as the Borelli reference pertains to a completely distinct field of endeavor, which is “depositing a high density biological chemical array onto a solid support” (see Abstract and Col. 1, Lines 11-16 of the Borelli reference). In course of that the Borelli reference is concerned with a “device that can be used in sample transfer between multiwell plates of differing well density” (see again Col. 1, Lines 11-16). To enable such transfer, the Borelli reference further teaches that the device is constructed in such a way that “a reservoir (is built) which retains liquid by capillary pressure” (see Abstract).

Accordingly one of ordinary skill in the art would immediately read such disclosure in such a way that the devices of the Borelli reference are not useful to allow separation of substances by means of a membrane formed by a bundle of capillaries. Particularly, as the device disclosed in the Borelli reference is characterized by “walls of high density and no open porosity” (see Col. 5, lines 1-2).

Furthermore the Filippi reference highlights that a flexibility of the capillaries is of advantage (see above).

Therefore one of ordinary skill in the art is neither taught nor suggested to read any further document of prior art that does not pertain to “flexible” capillaries (such as the Borelli reference) when departing from the Filippi reference at the date the current invention was made.

However, If the person of ordinary skill in the art would consider further prior art of that type the Borelli reference would not be considered as relevant as it pertains to a different field of endeavor.

Now – and for purely academic reasons – if the person of ordinary skill in the art would continue reading the Borelli reference after having read the abstract thereof which actually would negate this in view of the foregoing, said person would still not find the teaching of the Borelli reference applicable to the teaching of the Filippi reference, as according to the Borelli reference “preferably a (...) square or round channeled, monolithic honeycomb preform (...) results from (...) extrusion.” (see Col. 4, Lines 43-47).

Thus the material sintered is not a capillary at all, but a monolithic preform. Further to that the Borelli reference teaches that by means of said sintering “channel walls of high density and no open porosity” (see Col. 5, Lines 1-5) are to be produced. This is fully contradictory to the teaching of the Filippi reference which needs to have a possibility for mass transfer over the capillaries to put the device described therein to work.

Accordingly, there is no combined teaching of the Filippi and Borelli reference that might suggest or motivate one of ordinary skill in the art to replace flexible capillaries of the Filippi reference with sintered ceramic capillaries such as used in Applicants invention.

Thus there is no basis for combining the teachings of the Filippi reference with those of the Borelli reference, but even if these references could be combined, the resulting apparatus would not be able to serve as a “separation module” as the ceramic capillaries of the Filippi reference sintered in accordance with the method of Borelli

(which indeed does not disclose sintering capillaries at all) would be non-porous and thus would not allow for mass transfer.

Further to that the Examiner turns to the Garcera reference to overcome the discrepancies a) to g). Using the Garcera reference by contending that the Garcera reference also discloses usage of sintered ceramic capillaries as to a) above, further underlines that the foregoing Borelli reference is not suitable to overcome any discrepancy between the Filippi reference and the present invention as defined by Claim 27.

In turning to the Garcera reference and particularly citing the passage of Col. 6, Lines 64-66 and Col. 7 Lines 13-26 the Examiner contends that "... capillaries (...) are sintered..." .

In fact, Applicants are not able to find that disclosure in the cited passage of the Garcera reference. According to the Garcera reference "projections 16, e.g. of ceramic material, are disposed on the zone of the outside surface at the end of the member where it faces the gasket. They (the projections) are obtained as follows: after or before the member is sintered, a tape of ceramic paste is deposited on the end of the member and then baked in order to sinter said tape and to sinter it to the surface of the member." (see Col. 6, Lines 60-67).

From the foregoing it is apparent that the Garcera reference does not disclose the capillaries being in a sintered state before being arranged in a "member". Furthermore and analyzing Fig. 6 to which the cited passage refers it's clear that the "tape of ceramic paste" is neither used to establish any distance between the capillaries nor employed between the bundle of capillaries at all. According to the description and Fig. 6, the tape of ceramic paste is used to fix the bundle of capillaries to the gasket. By no means can these elements be read as of being the "ceramic film strips" of the current invention.

Accordingly, no person reading the Filippi / Borelli / Garcera combination of references could ever be led to Applicants' novel separation module.

The rejection of claims 4-5, 7-9 and 26-27 under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) should therefore be withdrawn.

Claims 2, 6, 12 and 15 stand rejected under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Taketomo (US 4,671,809).

The differences between Applicants' claims and anything that can be derived from the Filippi / Borelli / Garcera combination of references have been discussed above.

The Examiner relies on Taketomo for defined distances and an end plate. No defined distances or end plates could possibly overcome the differences pointed out above between the module defined by Applicants' claims and anything that could be derived from the Filippi / Borelli / Garcera combination of references.

The rejection of claims 2, 6, 12 and 15 under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Taketomo (US 4,671,809) should therefore now be withdrawn.

Claims 10-11 and 16 stand rejected under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Hersey (US 4,990,412).

The differences between Applicants' claims and anything that can be derived from the Filippi / Borelli / Garcera combination of references have been discussed above.

The Examiner relies on Hersey for thin membranes with separation activity on the inside / outside of the sintered ceramic capillaries. No thin membranes with separation activity on the inside / outside of the sintered ceramic capillaries could

possibly overcome the differences pointed out above between the module defined by Applicants' claims and anything that could be derived from the Filippi / Borelli / Garcera combination of references.

Furthermore it should be noted that if the Borelli reference is used thin membranes anywhere on the capillaries would be completely useless as the capillaries sintered as to the Borelli reference would not allow for mass transfer (see above)

The rejection of claims 10-11 and 16 under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Hersey (US 4,990,412) should therefore now be withdrawn.

Claims 13 and 14 stand rejected under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Shay (US 4,310,607).

The differences between Applicants' claims and anything that can be derived from the Filippi / Borelli / Garcera combination of references have been discussed above.

The Examiner relies on Shay for a housing of stainless steel. No stainless steel housing could possibly overcome the differences pointed out above between the module defined by Applicants' claims and anything that could be derived from the Filippi / Borelli / Garcera combination of references.

The rejection of claims 13 and 14 under 35 U.S.C. 103(a) as obvious over Filippi (US 3,536,611) in view of Borelli (US 6,350,618) and further in view of Garcera (US 4,640,774) as applied to claim 27 above and further in view of Shay (US 4,310,607) should therefore now be withdrawn.

Applicants note that the Examiner has omitted rejections using the irrelevant Bellhouse and Dobo references cited in previous office actions.

In view of the present amendments and remarks it is believed that claims 2, 4-11,

13-16 and 18-28 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested and the allowance thereof is courteously solicited.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this amendment is required, applicants request that this be considered a petition therefore. Please charge the required petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fee or credit any excess to Deposit Account No. 14-1263.

Respectfully submitted,
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